Minimally invasive transaxillary surgery: A novel technique for the resection of axillary Castleman disease

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Received for publication Sept 1, 2023; revisions received Oct 23, 2023; accepted for publication Nov 1, 2023; available ahead of print Nov 10, 2023.

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JTCVS Techniques 2024;23:175-7
2666-2507

https://doi.org/10.1016/j.xjtc.2023.11.002

CT shows lymph nodes characteristic of axillary Castleman disease.

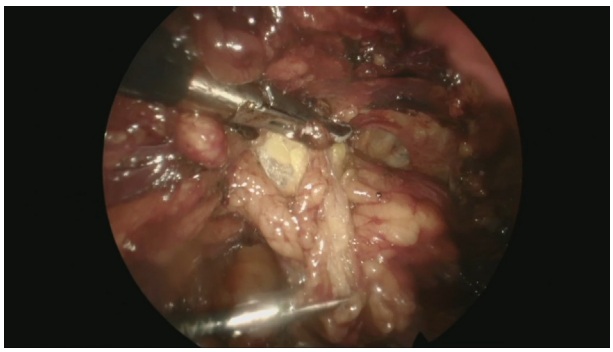
CENTRAL MESSAGE

We describe a novel minimally invasive transaxillary approach, creating an extra-thoracic working space, for resection of axillary Castleman disease.

Video clip is available online.

Castleman disease (CD) is a rare, benign, lymphoproliferative disorder characterized by lymphadenopathy, and in the case of unicentric disease (affecting a single region), the pathogenesis is unclear.[1] This disease has been described at various sites, with the majority of cases affecting the mediastinum, neck, abdomen, and retroperitoneum. CD has been found to affect the axilla in only 2% of cases, explaining the paucity of publications.[2] Existing reports primarily focus on the diagnostic approach for axillary CD, highlighting imaging and histologic morphology of biopsies.[2] According to international guidelines for the management of unicentric CD (UCD), preferred first-line treatment is complete surgical resection.[1] Observation and medical management is only recommended in the case of unresectable UCD.[1] Yet, the ideal surgical approach for disease of the axillary space has not been defined. Minimally invasive approaches in this area have not been published in general. However, dissecting minimally invasively where there is no natural space has been previously addressed in laparoscopic total extraperitoneal inguinal hernia repair: the preperitoneal space is created (with or without the use of a dissecting balloon) and a working space is maintained using insufflation.[3] We describe a similar technique for a minimally invasive resection of axillary lymph nodes in the case of UCD, requiring creation of an extrathoracic space with CO_2 insufflation, that builds on our previous experience with minimally invasive transaxillary resection of a lymphangioma (Video 1).[4] Institutional review board approval was not required; the patient provided informed written consent for the use and publication of deidentified information.

A 44-year-old female patient with no previous medical history presented with swelling in her right supraclavicular fossa and axilla. Initial evaluation revealed adenopathy, with the largest right axillary lymph node measuring 5 × 2.2 cm and another subpectoral lymph node measuring 3 × 1.2 cm (Figure 1, *A* and *B*). Biopsy revealed hyaline vascular-type CD. The patient was referred to oncology



VIDEO 1. Comprehensive case video. Video available at: https://www.jtcvs.org/article/S2666-2507(23)00408-X/fulltext.

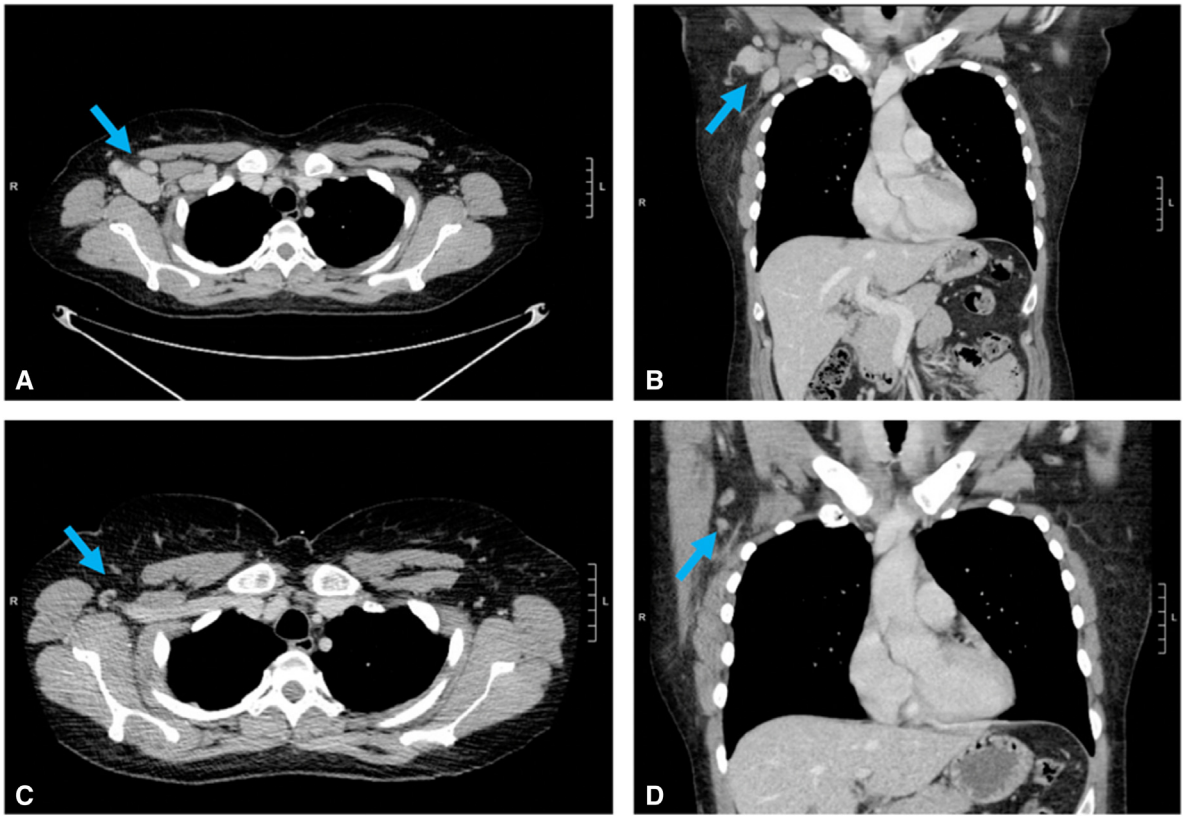


FIGURE 1. Preoperative (A) axial and (B) coronal CT images showing lymph nodes characteristic of axillary Castleman disease. Postoperative (C) axial and (D) coronal CT images demonstrate the success of the procedure. The presence of few residual lymph nodes is noted, with the largest measuring 1.3 cm.

and subsequently referred to thoracic surgery. It was recommended that she undergo resection of her clavicle in combination with axillary dissection for the management of her disease. She presented to our clinic for a second opinion. Given the location and our experience, we proposed a novel minimally invasive technique for resection of the involved lymph nodes.[4] The patient was brought into the operating room and placed supine with her right arm abducted, in order to provide exposure to the axilla. Both adult (5 mm) and pediatric (2 mm) laparoscopic instruments were used to conduct this case. We have previously described the utility of pediatric laparoscopic instruments in minimally invasive thoracic surgery, particularly the suitability of the length of these tools in this space.[5] A 5-mm incision was made, and the optical trocar was used to bluntly dissect the space between the serratus anterior and latissimus dorsi. The optical trocar allows visualization of tissue layers upon entry, thus aiding in identification of the desired space.[4] Once the operative plane was visualized, CO_2 insufflation was used to create a working space. Two 5-mm ports and two 2-mm ports were used (Figure 2, *A*). Dissection was done to clear the axillary contents. Care was taken to avoid injury to the neurovascular structures, and bipolar cautery was used to avoid damage to the long thoracic nerve (Figure 2, *B-D*). The thoracodorsal vein, axillary vein, and subclavian vein were followed as landmarks to identify lymph nodes along these vessels. Significantly enlarged lymph nodes were removed. However, some lymphatics were spared in order to avoid lymphedema, a concern the patient had voiced before the operation. Lymph nodes were sent to pathology, confirming the diagnosis of hyaline vascular-type UCD. A Jackson–Pratt drain was placed, and the patient was discharged to home on the same day. The drain was removed at postoperative day 15, and the patient was doing well with no lymphedema at follow-up. Postoperatively, computed tomography imaging demonstrated a few small residual lymph nodes, with the majority being subcentimeter (Figure 1, *C* and *D*). This is consistent with our decision to avoid a radical lymph node dissection, preventing lymphedema. The patient continues to follow-up with oncology and undergo annual surveillance imaging. If residual nodes progress, this minimally invasive approach allows us to revisit the possibility of resection.

This case demonstrates, to our knowledge, the first minimally invasive resection of UCD presenting in the axilla. We demonstrate a novel transaxillary approach with the use of CO_2 insufflation. The use of an optical trocar, visualizing the anatomic structures, aids in identification of this extrathoracic space, thus avoiding a debilitating clavicle resection. This case demonstrates that surgical resection,

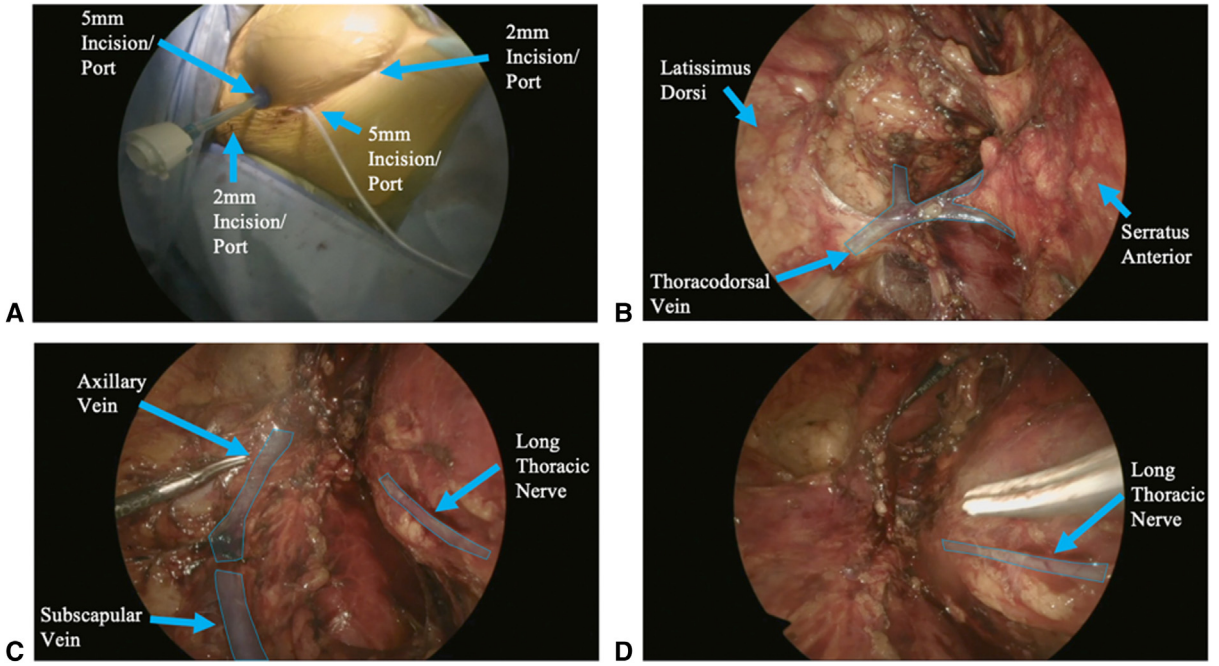


FIGURE 2. The (A) placement of ports/incisions for this case and (B-D) important anatomical structures identified throughout the case are highlighted.

the current gold standard for the treatment of UCD, in the axillary region can be done both safely and feasibly.

Conflict of Interest Statement

Dr Marshall has received honoraria and consultancy fees from Intuitive, Inc, and honoraria from Siemens, Inc. All other authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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